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Mental causation and mental properties[†]

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ABSTRACT

The aim of this paper is to defend the causal homogeneity of functional, mental properties against Kim's attack. It is argued that (a) token identity is sufficient for mental causation, that (b) token identity implies a sort of functional reduction, but that (c) nonetheless functional, mental properties can be causally homogeneous despite being multiply realizable: multiple composition is sufficient for multiple realizability, but multiple composition does not prevent the realizers from having their pertinent effects in common. Thus, the causal exclusion problem provides no argument for abandoning the position that there are functional, mental properties that are natural kind properties.

1. *The causal exclusion problem*

The following four principles are a popular way of setting out the mind–body problem. Each of these principles is plausible taken on its own. But it is difficult to see how they can be true taken together:

- (1) *distinction*: Mental states are distinct from physical states.
- (2) *mental causation*: Mental states cause physical states.
- (3) *completeness*: For any physical state *p*, insofar as *p* has a cause, it has a complete physical cause (that is, a sufficient physical cause).
- (4) *no systematic overdetermination*: If mental states cause physical states, there is no systematic overdetermination of the physical states in question by complete physical causes and additional mental causes.

These four principles imply what is known as the *causal exclusion problem*: given (3) it seems that physical causes exclude – or at least pre-empt – mental causes.

This paper will only be concerned with the causal exclusion problem. If we conceive physical states in the last resort as the states that are described by a fundamental and universal physical theory – such as quantum field theory or general relativity – the causal exclusion problem touches not only mental causes. It extends to all so-called higher-level causes such as chemical, geological, biological, and neurobiological causes. If we explain “physical states” in the above mentioned four principles as “fundamental physical states” (or “microphysical states” for that matter), we can replace “mental states” with “chemical states”, [6] “biological states”, etc. The problem thus is a general one. Consequently, the position considered in this paper concerns not only mental causes, but all so-called higher-level causes.

In order to search for a solution to this problem, it is sufficient to conceive causation as a relation between individual states (state tokens), one state token causing another state token. For the sake of sketching out a solution to this problem, it is not necessary to commit us to one particular view of states: states may be states of substances (continuants), or they may simply be four-dimensional events (occurrences). It is, however, necessary to adopt a fine-grained view of state tokens: *let us regard a state token as an instance of a property – that is,*

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a property token – occurring at a certain time. Such a fine-grained conception is indispensable to capture mental causation: the point at issue is whether an instance of a mental property (a mental state token) can stand in a causal relation to an instance of a physical property (a physical state token). For example, the headache of Mary this noon is a mental state token. The question is whether this state token causes a physical state token such as Mary's arm reaching out for an aspirin.

There is no easy solution to this problem: it is not plausible simply to drop any of the four principles mentioned above. If one abandons (4), one has to maintain that all the effects that mental causes produce are simultaneously produced by physical causes. For instance, in any case when my right arm goes up, there are physical laws and initial conditions that yield a certain probability for a state token of the type right arm going up occurring, and there are mental causes, distinct from the physical causes that yield the very same probability. Consequently, the supposition seems to be superfluous that for some physical effects, there are not only physical causes, but also mental causes (which are distinct from the physical causes).¹ Mental causation seems to fall victim to Occam's razor.

If one gives up (3), one runs into a dilemma. Physical causation is tied to laws. There are physical laws that yield, together with initial conditions, for any physical state of a type *P* a certain probability of occurring. The one horn of the dilemma is that some physical laws are false, because they do not indicate the correct probabilities for the occurrence of physical state tokens of certain types (that is, those states which also have mental causes, the mental causes being distinct from the physical ones). Physical laws and initial conditions yield a certain probability for my right arm going up in the next five minutes. (At least if we go down to the microphysical level, there are strict laws that indicate, given initial conditions, a certain probability, say, for the changes of movements of atomic particles in my right shoulder occurring that are necessary for my right arm to go up). If, in the next five minutes, I take the decision to lift my right arm (mental state token), this decision is a mental cause that raises the probability for a state token of the type [7] right arm going up occurring, including the occurrence of the microphysical state tokens that are necessary for my right arm going up in the given situation. Hence, the physical laws and initial conditions do not indicate the correct probabilities for physical states of certain types to occur, because they ignore one crucial factor that enters into the determination of these probabilities, namely mental intentions.

The other horn of the dilemma is to say that there are physical states of certain types to which physical laws do not apply (namely, the states which also have mental causes). My body (or a part of it – such as the brain or one particular area of the brain) is a physical system that interacts with a non-physical system (mental causes) so that it does not come under physical laws. Note that the problem which the principle of completeness poses for mental causation is independent of whether or not the physical causes are deterministic or probabilistic. Hence, the question of whether or not our current basic physical theories contain irreducibly probabilistic laws is irrelevant to the problem of mental causation.²

Giving up (2) seems to be a possibility to be envisaged only as a last resort. Mental causation is a cornerstone of the view of ourselves as thinking and acting beings. If there were no mental causes, there wouldn't be any actions, no freedom to act, etc. It is, however, my

¹ But see Loewer (2001), Marcus (2001), and Bennett (2003).

² See Loewer (1996) and Esfeld (2000).

intention to put down my thoughts that causes my typing this paper, etc. As regards (1), the multiple realizability of mental states is widely taken to show that mental states are distinct from physical states.

2. *The functionalist solution*

There is a standard solution to the problem of mental causation based on functionalism that is able to accommodate all four mentioned principles in a certain sense. According to functionalism, mental states are functional states, defined by a causal role. That is to say, a certain pattern of causes and effects defines a mental state of the type *M*. These include mental states of other types as well as input states and output states. For instance, to give a rough idea, a functional definition of pain may include tissue damage as a characteristic cause and distress and wincing as characteristic effects. According to the mainstream conception of functionalism, a functional state (or property) is a second order state (or property), namely the state of being in some – first order – state that fills the causal role in question. The distinction between first order and second order states is relative: a biological state that realizes a mental state is a first order state with respect to the mental state, but it may itself be a second order, functional state with respect to a microphysical state. The first order states that realize a functional state can be of various sorts: all they need to have in common is to exercise the causal role in question. Thus, functional states admit of multiple realization by first order states. [8] For instance, it may be the case that pain is realized by the firing of C-fibres in humans, but it is realized in another way in octopuses, and it may be realized by states of silicon chips in Martians. In that case, the realization of pain varies from species to species.

Multiple realizability of a mental type *M* may go even further than that. The type of physical tokens that realize *M* may vary from individual case to individual case. This may to a certain extent be true of intentional states: Why should the neural state token that realizes my belief this morning that grandmothers deserve respect be of the same type as the neural state token that realizes your belief this morning that grandmothers deserve respect, or the token that realized my belief of the same type last week?

Realization, thus construed, is a relation between one functional type and many first order tokens. It is, however, misleading to conceive single first order state tokens as the realizers of a functional type. In each case, it is rather an arrangement of first order state tokens that realizes a functional state type.³ For instance, it is not the firing of C-fibres as such that realizes pain in humans. Rather, a given token of C-fibres firing realizes a state of the type pain if and only if this token is suitably related with other brain state tokens so that these tokens taken together produce a characteristic pain reaction such as wincing. It is therefore reasonable to conceive realization as a relation between a functional state type and arrangements of first order state tokens.

The idea hence is this one: mental state types are realized by arrangements of physical state tokens. On the one hand, because of multiple realizability, mental state types (mental properties) are distinct from physical state types (physical properties). On the other hand, since all the mental states that occur in the actual world are realized by arrangements of physical tokens and since causation is a relation between state tokens, physical causes do not exclude or pre-empt mental causes.

³ Compare the distinction between “core realizers” and “total realizers” that Shoemaker (1981, section 2) draws.

My first claim is that conceiving realization as amounting to identity between mental state tokens and physical state tokens is sufficient to account for mental causation. That is to say, any mental token that there is in the world is identical with an arrangement of physical tokens (or, at least, constituted by an arrangement of physical tokens).⁴ Thus, Mary's headache this noon is identical with (or constituted by) a brain state token such as her C-fibres firing this noon in relation to suitable other brain state tokens (that taken together produce her reaching out for an aspirin). One may object that Mary's headache this noon could have been realized in another way than by that arrangement of physical tokens: if that [9] arrangement of physical tokens did not occur, her headache could nonetheless have occurred, being realized in another physical way. However, in that case, Mary would have had another headache-token this noon – although that headache-token could have been qualitatively indistinguishable from the one that actually occurred. The identity between tokens is, of course, necessary. What is contingent is that other tokens of the same type than the actual ones could have occurred.

If a mental token is identical with an arrangement of physical tokens, the effects that the arrangement in question produces are the effects that the mental token produces. If there is identity of property tokens, there is no conceptual space left for asking whether the cause produces an effect in virtue of its mental or in virtue of its physical properties. Mental tokens cause physical tokens, being identical with physical tokens. Note that a particular arrangement of physical tokens is a case of the mental type *M* (a mental token) only because it exemplifies the causal relations – the pattern of causes and effects – that characterize *M*.

Can we do with anything less than token identity? In other words, is the assumption of token identity not only sufficient, but also necessary in order to account for mental causation, given completeness (3) and the absence of systematic overdetermination (4)? Stephen Yablo (1992), to mention one influential argument against token identity, proposes to conceive realization as a case of the relation between determinables and determinates. Being in a state of C-fibres firing in suitable relation to other brain states is a way of being in pain – as being aquamarine is a way of being blue. According to Yablo, there is no identity between a token of a determinate (such as being aquamarine, or being in a state of C-fibres firing) and a token of a determinable (such as being blue, or being in a state of pain).⁵ Nonetheless, he maintains that there is no competition for causal efficacy between determinables and their determinates. However, one can argue that if there is no token identity, determinables and their determinates do not compete for causal efficacy, simply because tokens of determinables are at most in some sense causally relevant to the production of effects, but the actual causal work is done by the tokens of the determinates. Thus, it is the token of C-fibres firing in suitable relation to other brain state tokens (and not the pain token) that actually produces all the effects that are characteristic of pain. Establishing this point would of course require further argument.⁶

Nevertheless, it is evident that token identity is sufficient for mental causation – and arguably also necessary. Jaegwon Kim argues for token identity as a necessary and sufficient condition for mental causation in his influential book [10] *Mind in a physical world* on the

⁴ I shall not discuss the distinction between token identity and constitution in this paper. See Poland (1994, 16-18).

⁵ But see MacDonald & MacDonald (1986, 149-150), who argue that the relation between a token of a determinate property and a token of a determinable property is identity.

⁶ See Pineda (2002, 36-40), for an argument against Yablo (1992) along these lines.

basis of the causal exclusion problem (1998, chapters 2 and 4). In a précis of that book, he sums up his claim in these words:

If M is to retain its causal status, it must be reducible to P – at least, the given instantiation of M must be reductively identifiable with the instantiation, on that occasion, of its supervenience or realization base. (Kim 2002b, 642)

In other words, identity between a given token m and a given arrangement of physical tokens p is necessary and sufficient to solve the problem of causal exclusion.

3. *Functional reduction*

The claim of token identity is a sort of reductionism about the mental: all mental tokens that there are in the actual world are nothing but arrangements of physical tokens. As Kim (1998, chapter 4) makes clear, functionalism with respect to mental properties allows us to apply the Ramsey–Lewis method of functional reduction (see Lewis 1970). This method suits well with token identity. We can briefly characterize it in this way: (1) Let M be a functional, mental type. We define M through its relations to other types, that is, relations to other mental types as well as – physical – inputs and outputs. (2) We replace the concepts that figure in this definition by free variables. (3) We bind these variables by existential quantification, thus postulating that there is at least one realization of M (this is the Ramsey-sentence of M). (4) We discern realizations of M . That is to say, we replace the variables with a description of realizer states that stand in the appropriate relations. That description no longer contains the mental concepts figuring in the definition of M .

If we assume that any realization of M is a physical realization of M by an arrangement of physical tokens, the Ramsey–Lewis method shows us a way to describe any token of M in a physical vocabulary alone. The force of the Ramsey–Lewis method of functional reduction is evident in the case of the multiple realization of a functional, mental type M : this method shows that and how it is in principle possible to give a physical description of each case of M , however scattered the multiple realization of M may be. No extensional equivalence between mental and physical concepts is required for that reduction.

The Ramsey–Lewis method of functional reduction provides for holism: the definition of any mental type includes relations to other mental types. Functional reduction therefore does not imply that it is in principle possible to give a physical description of each mental token taken separately. It may only be possible to pick out in a physical vocabulary the arrangement of physical tokens that is identical with a cluster of mental tokens. Holism is widely accepted with respect to intentional states. Relations to other belief states are constitutive of, for instance, being [11] in the belief state that grandmothers deserve respect. Consequently, it may not even in principle be possible to single out a description of physical tokens that are the realizers of a belief of that type alone on the given occasion. It may even in principle only be possible to give a physical description of the realizers of the relevant cluster of belief states. However, in order to avoid an unnecessary complication in setting out the argument of this paper, I shall ignore this qualification in the following.

What is more, the physical description of a functional token amounts to an explanation of that token. Why are there tokens of a mental type M in the world? Because there are arrangements of physical tokens that stand in the causal relations that define M , that is, physical tokens which have the causes and effects that are characteristic of M . Even if there is an extreme variety in the physical realizers of M , token identity entails psycho-physical laws

by permitting functional reduction: any arrangement of physical tokens that is of the same physical type as a given arrangement of physical tokens realizing a mental type *M* is also a case of *M*. One can even maintain that any such law holds with metaphysical necessity: there is no possible world in which any such arrangement of physical tokens fails to be a case of *M*, for any such arrangement satisfies the definition of *M*.

Nonetheless, functional reduction does not prevent mental properties from being unitary kinds. The fact that it is a law, say, that any case of C-fibres firing in suitable relation to other brain state tokens is a case of pain, does not hinder that it may also be a law that any case of certain relations among silicon chips is a case of pain, too. In particular, functional reduction does not exclude that mental properties (mental kinds) may be distinct from physical properties (physical kinds) because of multiple realization. *My second claim therefore is that the functional conception of mental types, including functional reduction, implies no more – and no less – than that any mental token can in principle be described and explained in a physical way.* Again, this is in accordance with what Kim says: functional reduction amounts to “each instance of *M* being reductively identified with an instance of *M*’s physical realizers” (Kim 2002b, 642).

4. *Mental types: causally homogeneous or causally heterogeneous?*

We have answered the question how the physical realization of mental states rules out that mental causes compete with physical causes: if (and only if) mental tokens are identical with physical tokens, there is no such competition. Nonetheless, in order to vindicate mental properties, more has to be done: one has to show that *M* is a homogeneous state or property. Since *M* is a functional type, defined by a certain pattern of causes and effects, this means that there are specific causes and effects, characteristic of *M* alone and instantiated by all and only its realizers.

[12] Kim takes the argument from causal exclusion in conjunction with the argument from functional reduction to refute that assumption. He says:

... if the “multiplicity” or “diversity” of realizers means anything, it must mean that these realizers are causally and nomologically diverse. Unless two realizers of *E* [emergent property in the sense of higher-level, functional property] show significant causal/nomological diversity, there is no clear reason why we should count them as two, not one. It follows then that multiply realizable properties are ipso facto causally and nomologically heterogeneous. This is especially obvious when one reflects on the causal inheritance principle. All this points to the inescapable conclusion that *E*, because of its causal/nomic heterogeneity, is unfit to figure in laws, and is thereby disqualified as a useful scientific property. ... The conclusion, therefore, has to be this: as a significant scientific property, *E* has been reduced – eliminatively.⁷

This argument can be summed up in this way, focussing on mental types:

- A) Each token of a functional, mental type is identical with the physical token that realizes the mental type in the given situation.
- B) The multiple realizability of mental types implies that the different realizers of a mental type are causally and nomologically heterogeneous.

⁷ Kim (1999, 17-18). See already Kim (1992, 17-19).

C) Consequently, the mental type is not causally and nomologically homogeneous. In Kim's words, the causal power of any mental property *M* is sundered into the various causal powers of its different realizers.⁸

If this argument were true, it would show that there are no genuine mental properties: since a functional kind is defined by certain characteristic causes and effects, there are functional, mental kinds if and only if there are mental types that are causally and nomologically homogeneous – in other words, that have certain causes and effects which are characteristic only of the type in question and which come under a natural law.

The crucial assumption in Kim's argument is (B). My counter-argument to (B) is based on the premise that functional types are not realized by single physical tokens, but by arrangements of physical tokens. As mentioned above, pain in humans is not realized by the firing of C-fibres as such. Rather, a given token of C-fibres firing realizes a state of the type pain if and only if this token is suitably related to other brain state tokens so that these tokens taken together produce a characteristic pain reaction such as wincing. In general, the physical realizers of functional types are in the last resort tokens of fundamental physical properties. Fundamental physical properties are such that they can be instantiated at points of space–time (or regions of space–time that come arbitrarily close to the size of a point). If functional properties are higher-level properties, this means at least that they require more than a point of space–time to be instantiated. Hence, in any [13] case, in the last resort, what realizes a functional property can only be an arrangement of tokens of fundamental physical properties.

To make this point, it is sufficient to assume that the properties which our basic physical theories describe and which require nothing bigger than a point of space–time to be instantiated are fundamental with respect to chemical, biological, and mental properties. For the argument of this paper we do not have to commit ourselves to the view that there is one absolutely fundamental level of nature.⁹ In any case, the fundamental physical properties tokens of which realize functional properties do not have to be intrinsic properties. They may be relational properties (being relational does not imply that they are functional properties, since first order properties can be relational as well).¹⁰

Against this background we can counter Kim's argument in the following way: (1) It is sufficient for the arrangements of physical tokens that realize *F* to be diverse that they are composed in diverse manners of – in the last resort – tokens of fundamental physical properties.¹¹ In other words, multiple composition is sufficient for the realizers of a functional type to be diverse, because the realizers are distinguished by their composition: two arrangements that are composed in two different manners of instantiations of in the last resort fundamental physical properties are two different types of realizers of the same functional property.¹²

(2) The causal inheritance principle is to say that any token of a functional property *F*, being identical with (or constituted by) an arrangement of physical tokens, inherits its causal power (that is, its capacity to produce specific effects) from that arrangement; for the causal

⁸ See also Kim (1998, 106-112); Kim (2002b, 643).

⁹ As regards doubts whether there really is one absolutely fundamental level, see Schaffer (2003), Block (2003) and the reply of Kim (2003) to Block.

¹⁰ As regards that matter, see Esfeld (2004).

¹¹ Kim (2003, 167-168) mentions multiple composition.

¹² For a different view, see Shapiro (2000, section 4).

power of that arrangement is – or at least includes – the causal power that defines the type *F*. That is why the arrangement in question is a realization of *F*. The arrangement, in turn, inherits its causal power from – in the last resort – the causal powers of the tokens of fundamental physical properties of which it is composed. The causal powers of these tokens determine the causal power of the arrangement.

All the instantiations of causal powers that there are in the world are manifestations of the four types of interaction that fundamental physics acknowledges – weak and strong interaction, electromagnetism and gravitation; only the last two are relevant on a macroscopic scale. These types of interaction can be instantiated by point-like particles or field sources. However, it does not follow from this that causal relations obtain only between point-like particles or field sources. Specific arrangements of tokens of fundamental physical properties can exercise [14] specific causal powers by having specific effects. Kim is happy to grant this. He does not take the argument from causal exclusion and the argument from functional reduction to suggest that there is causation only on the level of fundamental physics.¹³

(3) The causal inheritance principle permits that different manners of composition by tokens of fundamental physical properties lead to arrangements that produce macroscopic effects of the same type. It is true that these properties can be defined by the causal and nomological relations in which they stand. If these are fundamental physical properties, which can be instantiated at a space–time point, there is no other way of distinguishing different kinds of such properties. Nonetheless, if tokens of these properties compose arrangements that realize a given functional property, what is characteristic of these arrangements and what distinguishes one type of arrangements from other types of arrangements is their composition.

No two arrangements that are composed in two different ways by tokens of fundamental physical properties produce exactly the same effects. Kim's argument in the citation above is not the trivial point that there is some difference in the effects that different realizers have, but that the different realizers “show significant causal/nomological diversity”. The counter-argument is that the arrangements that realize a given functional property, despite being composed in different manners, can have the same pertinent macroscopic effects: (a) they all produce effects of the same type, (b) for each of these arrangements, these are the significant that the arrangement produces and (c) only these arrangements bring about the effects in question.¹⁴ If we classify the arrangements of tokens of fundamental physical properties according to the significant effects that they produce, all and only the arrangements that realize a given functional property come under the same category. That is why they realize a certain functional property, defined by certain characteristic causes and effects. This is particularly evident if one considers the multiple realization of biological functional properties: properties of organisms are selected for the effects they have. Selection is blind to composition.¹⁵

(4) Given (1) to (3), the multiplicity or diversity of the realizers of a functional, mental type *M* does not imply that these realizers are causally and nomologically diverse in any relevant

¹³ Kim (1998, 112-118). But see Bontly (2002) who claims that Kim's causal exclusion argument has just this consequence.

¹⁴ See Antony (1999, 19-22), and Clapp (2001, 126-132), as well as Batterman (2000, 134). Compare furthermore what Shoemaker (2001, in particular 79), calls forward-looking causal features that are common to all and only the realizers of a given functional property.

¹⁵ See Papineau (1993, chapter 2).

sense – that is, in a sense of ruling out that M is a homogeneous property. Against this background, one can set out to establish [15] that M is a homogeneous property by making use notably of the following two criteria:

- i) *projectibility and laws*: Arrangements of physical tokens that realize a functional, mental type M permit an induction to generalizations about M itself (all cases of M). This implies that there are laws about M .
- ii) *counterfactual robustness*: The tokens of M are not exhausted by the tokens in the real world.¹⁶ In other possible worlds, arrangements of tokens of other types realize M .

In sum, functional properties are defined by a causal role, whereas types of realizers are defined by their composition. Since causal role and composition can differ, functional properties can be causally homogeneous and multiply realizable. If they are causally homogeneous, satisfying at least the two mentioned criteria, one can maintain that they are natural kind properties. Thus, there can be functional, natural kind properties despite multiple realizability.

My third claim hence is that the argument from causal exclusion and the argument from functional reduction leave open the conceptual and metaphysical space for there being functional mental properties that are causally homogeneous and therefore natural kind properties. Consequently, we can happily accept these arguments as providing for an account of mental causation and a physical explanation of each mental token that there is in the world without giving up the view that there are causally homogeneous functional, mental properties. Establishing that there is such a conceptual and metaphysical space is sufficient to counter Kim's argument, which is a general, *a priori* argument to the effect that there is no such space. What has been said in this section is not sufficient to show that there are in fact such natural kind properties. A detailed examination of concrete cases would be necessary for that.

5. Conclusion

This paper has argued in favour of three theses:

- 1) Identity between mental and physical tokens is sufficient (and arguably necessary as well) to solve the causal exclusion problem.
- 2) It is in principle possible to give a physical description and explanation of any mental token that there is in the world.
- 3) There is nothing in the world but tokens of fundamental physical properties and their arrangements. Such arrangements constitute different levels of complexity or organization, producing specific macroscopic [16] effects of various kinds, but token identity excludes that there are different levels of being.¹⁷ Nonetheless, some of these arrangements exemplify causally homogeneous, functional natural kind properties, defined by certain characteristic causes and effects, although they are composed in diverse manners by tokens of fundamental physical properties.

According to Kim, functional reduction leaves us with two possibilities as regards the mental property M : either identify M with the disjunction of the heterogeneous types of physical properties tokens of which realize M ($M = P_1 \vee P_2 \vee P_3 \vee \dots$) or eliminate M as a property in

¹⁶ Compare Fodor (1997, 153).

¹⁷ Compare Kim (2002a) and Heil (2003, chapters 2 to 7), against levels of being.

favour of a concept *M* that refers to all and only the diverse physical tokens of *M*.¹⁸ Both these possibilities amount to eliminativism with respect to functional properties as causally homogeneous and thus natural kind properties.¹⁹ According to the latter possibility, there are no mental properties, being multiply realized, but only mental concepts that we employ to refer to physical tokens of various sorts. According to the former possibility, taking pain as an example of a mental property, we have to conclude that there is no such thing as pain, but only pain-in-humans, pain-in-reptiles, or, in the worst case, the-pain-of-Jim-on-Saturday-morning, the-pain-of-Mary-on-Tuesday-night, etc. Hence, in the end, the conclusion that Kim draws from the causal exclusion argument and the argument from functional reduction is not a version of reductive physicalism, but a version of eliminativism.

However, the question is what all these tokens have in common so that it is true to apply the concept *M* to all and only these tokens. Full-blown eliminativism answers this question in the negative, eliminating the concept *M* as well in the sense of a referring concept (that is to say, eliminating folk psychology). If one does not want to go as far as that, one is driven back to recognizing the instantiation of a homogeneous pattern of characteristic causes and effects as that what makes true the various applications of the concept *M*. But that is to say: one gets back to recognizing a homogeneous functional, mental property.

Both the non-reductive physicalism that the argument from multiple realization suggests and reductive physicalism – as originally defended by Smart (1959) for example – recognize causally and nomologically homogeneous mental properties. The issue between these two positions is whether or not there is type–type identity. In other words, if one goes for reductive physicalism, one should better accept first that there are causally and nomologically homogeneous mental properties that are natural kind properties in order not to end up with a sort of eliminativism. In this sense, the argument of this paper, trying to vindicate homogeneous mental properties against Kim’s attack, fits well into the spirit of [17] functionalism qua non-reductive physicalism; but this argument is also necessary as a basis if one sets out to establish reductive physicalism in contrast to the sort of eliminativism to which Kim is driven.

Nonetheless, what has been presented in this paper, arguing for causally homogeneous mental properties, is nothing but a general scheme that applies to any functional property that is a natural kind property. In order to work out on this basis a solution to the problem of mental causation – in distinction, say, to the problem of biological causation –, one has to take into account (a) the problems that a functional conception of phenomenal experience (qualia) poses, (b) the externalism that applies to the conceptual content of intentional states and (c) the issue of whether or not free will is compatible with the token identity of mental and physical causes.*

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¹⁸ Kim (2002b, 642-643). See also Kim (1998, 103-112).

¹⁹ Compare Jacob (2002, 653-654) and the reply by Kim (2002c, 674).

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